

REMARKS

Claims 1, 2, 5-10, 13 and 14 are pending in this application. By this Amendment, the specification, claims and drawings are amended. The specification is amended to correct grammatical errors. No new matter is added.

I. Drawings

The drawings are objected to "because the elements of Fig. 2 are not labeled with indicia indicative of their function." As no such requirement is needed, Fig. 2 is not amended in reply to the objection.

The drawings are also objected to under 37 C.F.R. 1.83(a) for failing to show every feature of the invention specified in the claims. The drawings are amended in reply to the objection. Accordingly, withdrawal of the objection to the figures is respectfully requested.

II. Objections to the Specification

The specification is objected to as containing grammatical errors. A substitute specification is provided in response to the objection. The substitute specification contains no new matter and therefore is in compliance with 37 C.F.R. §1.125(b). The substitute specification also complies with 37 C.F.R. §1.125(c) in that it is submitted with markings showing all changes relative to the immediate prior version of the specification on record, i.e. the amendments to the specification included with the October 2, 2002 Petition and Preliminary Amendment.

It is also alleged that the Table on page 12 is "inconsistent with itself and must be corrected." Upon examination of the Table on page 12, and the accompanying text in the specification, it appears that the Table is consistent and accurately reflects the description of the Table within the specification at paragraphs [0024], [0025], [0047]-[0049]. As indicated in paragraph [0024], when the air within an interior of an optical fiber is replaced with an inert gas, the density of the energy emitted from the optical fiber increases. How much the

laser energy increased when the fiber was filled with the inert gas was examined and the results shown in Table 1 (see [0048]). The results shown on Table 1 clearly indicated an increased energy percentage in the optical fiber filled with an inert nitrogen gas. Accordingly, withdrawal of the objections to the specification is respectfully requested.

III. Amendment

The Amendment filed on January 10, 2006 is objected to under 35 U.S.C. §132(a) as introducing new matter into the Disclosure. Specifically, it is alleged that the claim amendment, which included "laser beam with 1-100 m/cm² of energy density and 1-1000 mJ/cm² of energy output" is new matter. The claims are amended to correct the minor typographical error and are accurately supported within the original specification at paragraphs [0029] and [0031], as pointed out in the outstanding Office Action at page 5, paragraph 2. Accordingly, withdrawal of the objection to the previously filed Amendment is respectfully requested.

IV. Claim Rejections Under 35 U.S.C. §112

Claims 1, 2, 5-10, 13 and 14 are rejected under 35 U.S.C. §112, first paragraph. Specifically, it is alleged that the disclosure fails to provide support for "laser beam with 1-100 m/cm² of energy density and 1-1000 mJ/cm² of energy output." As stated above, this language merely contained a minor typographical error and the proper language is adequately supported in the specification as discussed above.

It is further alleged that the original specification lacks antecedent support for "a chip of quartz glass in which hydroxide ions have been introduced" and is not enablingly described the specification either as to the manner in which the ions are introduced, nor the proportion of ions which are introduced. The pending claims recite in part "the cell is radiated with the laser through reflection and condensing which are affected through a chip of quartz glass in which hydroxide groups have been introduced." Support for this claim language may be

found in, for example, paragraph [0022] which recites "the transmittance of the optical fiber can be increased by increasing an amount of hydroxide groups in quartz through introducing the groups into quartz. The transmittance can be set at a desired level by adjusting the content of the hydroxide groups." As there is sufficient support in the specification for the claimed subject matter, the specification enablingly describes the claim language.

It is further alleged in the Office Action that the original specification does not provide adequate support for "the width of each polycapillary bundle element is variable along the length of each polycapillary bundle element." As this language is not recited in any of the pending claims, rejection of the claims based on this feature is moot.

Claims 1, 2, 5-10, 13 and 14 are also rejected under 35 U.S.C. §112, second paragraph. Specifically, it is alleged that claim 1 is indefinite because the exact meaning of the recitation of "laser beam with 1-100 m/cm² of energy density and 1-1000 mJ/cm² of energy output is unclear." As the claim is amended in response to the rejection, withdrawal of the rejection is respectfully requested.

It is further alleged that the remaining dependent rejected claims are indefinite for failing to further limit the claim from which it depends. As the remaining claims are amended in reply to the rejection, withdrawal of the rejection of the claims under 35 U.S.C. §112, second paragraph is respectfully requested.

V. Claim Rejections Under 35 U.S.C. §103

Claims 1, 2, 5-10, 13 and 14 are rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent 5,586,982 to Abela in view of "Flexible Hollow Wave Guides For Delivery Of Excimer-Laser Light" to Matsuura et al. (Matsuura) and further in view of U.S. Patent 6,039,726 to Lewis et al. (Lewis). The rejection is respectfully traversed.

None of the applied references, whether considered alone or in combination, disclose or suggest each and every feature recited in the rejected claims. For example, the

combination of references fails to disclose or suggest a method for processing a cell, comprising irradiating a living cell or a living tissue with a laser beam with 1-100 mJ/cm² of the energy density and 1-1000 mJ/cm² of the energy output through a hollow optical fiber filled with an inert gas; and cutting off, removing or boring a cell wall or a cell membrane or an entirety of the cell wall thus irradiated; wherein the cell is irradiated with the laser through reflection and condensing which are effected through a chip of quartz glass in which hydroxide groups have been introduced, as recited in amended claim 1.

Abela relates to a treatment apparatus and method for transfecting a patient's cells in vivo (col. 1, lines 18-21). The apparatus and method includes applying laser energy 18 to porate cells, for example at the same time as genetic code material is proceeding along the same paths as the laser energy 18 (col. 4, lines 49-58). Using an optical fiber 38, a laser beam is directed to a specific site within a patient. The laser 40 is pulsed to porate the cells. A treatment agent, such as genetic material or a drug, passes through a treatment agent channel 53 and is delivered to the cell site (col. 7, lines 40-66). It is recognized in Abela that a number of the cells will be killed and other cells may not be usefully porated (col. 8, lines 11-14). Thus, Abela generally describes use of a laser beam delivered through a hollow optical fiber to porate cells to deliver a treatment agent.

It is admitted in the Office Action that Abela fails to disclose the irradiating of living cells with the laser beam as recited in the rejected claims. To overcome the admitted deficiency, Matsuura is combined with Abela for teaching the formation of hollow wave guides for delivery of excimer laser light. Matsuura describes a method of vapor depositing an aluminum film on the inside of a glass capillary tube to be used as a wave guide for delivery of excimer-laser light. Matsuura also discloses use of an inert gas in the core to reduce attenuation of the laser light. Thus, although Matsuura describes a hollow optical fiber coated with an aluminum metal, Matsuura fails to disclose or suggest irradiating a living

cell or living tissue with a laser beam with $1-100 \text{ mJ/cm}^2$ of energy density in $1-1000 \text{ mJ/cm}^2$ of energy output, or use of a reflection and condensing laser which is reflected and condensed through a chip of quartz glass in which hydroxide groups have been introduced.

The additional reference of Lewis is further applied for its alleged description of a wave guide with a tapered tip in a medical system for applying high energy radiation. Lewis relates to surgical lasers for use with ArF excimer laser beams to provide precise cuts during tissue removal in a gaseous environment without collateral damage to surrounding tissues (col. 1, lines 11-17). Thus, Lewis relates specifically to use of high energy lasers to ablate soft tissue or use of such lasers to excise or cut tissue (see col. 4, lines 45-47).

The problem being addressed in Lewis is known failures in fiber guides to deliver high energy fluence. Specifically, delivery of such high energy fluence causes damage and failure to the fiber (col. 3, lines 36-39). Thus, Lewis provides an apparatus that will accept high energy lasers without damaging the delivery fiber so that such high energy lasers may be effective in soft tissue cutting (see col. 5, lines 24-26). Accordingly, Lewis does not relate in any way to irradiating a living cell or living tissue. Rather, Lewis is directed specifically to excision or ablating, i.e. destroying, soft tissue. Thus, one of ordinary skill in the art would not be motivated to combine such tissue destroying techniques with the claimed method of irradiating a living cell or living tissue. Accordingly, the combination of references fails to disclose each and every feature recited in the rejected claims. Thus, withdrawal of the rejection of claims 1, 2, 5-10, 13 and 14 under 35 U.S.C. §103(a) is respectfully requested.

VI. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1, 2, 5-10, 13 and 14 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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JAO:SMS/axl

Attachments:

Substitute Specification
Marked-Up Copy of Specification
Replacement Sheets (Figs. 1 and 6)

Date: June 19, 2006

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<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>

Amendments to the Drawings:

The attached replacement drawing sheets make changes to Fig. 1 and replace the original sheet with Fig. 1 and add new Fig. 6 on a separate sheet.

Attachment: Replacement Sheets